

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Sanger *et al.*,

Serial No.: 09/587,653

Filed: Jun

Group Art Unit: 1648

Examiner: Li, Bao Q.

Atty. Dkt. No.: UTSG:231US

CERTIFICATE OF MAILING
37 C.F.R. 1.8

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March 28, 2006

Date

For: 3' SEQUENCE OF THE GB virus B
(GBV-B) GENOME

STATEMENT AS REQUIRED UNDER 37 C.F.R. § 1.825(a) AND (b)
AND STATEMENT AS REQUIRED UNDER 37 C.F.R. § 1.821(g)

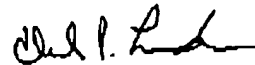
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Submitted herewith is a substitute computer readable form and a substitute paper copy of the sequence listing of those sequences in the captioned patent application, wherein minor errors have been corrected. The substitute computer readable form of the sequence listing is the same as the substitute paper copy of the sequence listing. The sequence information provided in the Specification is also the same as the sequence listing of the enclosed substitute computer readable and paper forms of the sequence listing.

In accordance with 37 C.F.R. § 1.821(g), it is herewith represented that no new matter is included with this submission.

Respectfully submitted,



FULBRIGHT & JAWORSKI L.L.P.
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Austin, Texas 78701
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Reg. No. 46,355
Agent for Applicants

Date: March 28, 2006

SEQUENCE LISTING

<110> SANGAR, DAVID V.
LEMON, STANLEY M.

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<150> 60/137,665

<151> 1999-06-04

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ggc	tct	cgg	cct	agc	tgg	ggc	ccc	aca	gac	ccc	cgg	cgt	agg	tgg	cgc	692				
Gly	Ser	Arg	Pro	Ser	Trp	Gly	Pro	Thr	Asp	Pro	Arg	Arg	Arg	Ser	Arg					
				105					110					115						
aat	ctg	ggt	aag	gtc	atc	gat	acc	ctt	acg	tgc	ggc	ttc	gcc	gac	ctc	740				
Asn	Leu	Gly	Lys	Val	Ile	Asp	Thr	Leu	Thr	Cys	Gly	Phe	Ala	Asp	Leu					
				120					125					130						
atg	ggg	tac	ata	ccg	ctc	gtc	ggc	goc	cct	ctt	gga	ggc	gct	gcc	agg	788				
Met	Gly	Tyr	Ile	Pro	Leu	Val	Gly	Ala	Pro	Leu	Gly	Gly	Ala	Ala	Arg					
				135					140					145						
gdc	ctg	cgc	cat	ggc	gtc	cgg	gtc	ctg	gaa	gac	ggc	gtg	aan	tar	gca	836				
Ala	Leu	Ala	His	Gly	Val	Arg	Val	Leu	Glu	Asp	Gly	Val	Asn	Tyr	Ala					
				150					155					160						
aca	ggg	aac	ctt	cct	ggt	tgc	tct	ttc	tct	atc	ttc	ctt	ctg	gcc	ctg	884				
Thr	Gly	Asn	Leu	Pro	Gly	Cys	Ser	Phe	Ser	Ile	Phe	Leu	Leu	Ala	Leu					
				170					175					180						
ctc	tct	tcg	ctg	act	gtg	ccc	gct	tca	gcc	tac	caa	gtg	cgc	aat	tcc	932				
Leu	Ser	Cys	Leu	Thr	Val	Pro	Ala	Ser	Ala	Tyr	Gln	Val	Arg	Asn	Ser					
				185					190					195						
tgg	ggg	ctc	tac	cat	gtc	acc	aat	gat	tgc	cct	aac	tcg	aat	att	gtg	980				
Ser	Gly	Leu	Tyr	His	Val	Thr	Asn	Asp	Cys	Pro	Asn	Ser	Ser	Ile	Val					
				200					205					210						
tac	gag	cgc	gcc	gat	gcc	atc	ctg	cac	act	cgg	ggg	tgt	gtc	cct	tgc	1028				
Tyr	Glu	Ala	Ala	Asp	Ala	Ile	Leu	His	Thr	Pro	Gly	Cys	Val	Pro	Cys					

215	220	225	
gtt cgc gag ggt aac gcc tgc agg tgt tgg gtg qcg ctg acc ccc acg			1076
Val Arg Glu Gly Asn Ala Ser Arg Cys Trp Val Ala Val Thr Pro Thr			
230	235	240	245
qtg gcc acc agg gac ggc aaa ctg ccc acc acg cag ctt cga cgt cat			1124
Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr Gln Leu Arg Arg His			
	250	255	260
atc gat ctg ctc gtc ggg agc gcc acc ctg tgc tgc gcc ctc tac gtg			1172
Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys Ser Ala Leu Tyr Val			
	265	270	275
ggg gac ctg tgc ggg tct gtc ttt ctt qtt ggt caa ctg ttt acc ttc			1220
Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly Gln Leu Phe Thr Phe			
	280	285	290
tct ccc agg cgc cao tgg acg acg caa gac tgc aat tgt tct acc cat			1268
Ser Pro Arg Arg His Trp Thr Thr Gln Asp Cys Asn Cys Ser Ile Tyr			
	295	300	305
ccc ggc cat ata acg ggt cat cgc atg goa tgg gat atg atg atg aac			1316
Pro Gly His Ile Thr Gly His Arg Met Ala Trp Asp Met Met Met Asn			
	310	315	320
tgg tcc cct acg gca gcg ttg gtg gta gct cag ctg ctc cgg atc cca			1364
Trp Ser Pro Thr Ala Ala Leu Val Val Ala Gln Leu Leu Arg Ile Pro			
	330	335	340
caa gcc atc atg gac atg atc gct qct cct ccc tgg gga gtc ctg ggg			1412
Gln Ala Ile Met Asp Met Ile Ala Gly Ala His Trp Gly Val Leu Ala			
	345	350	355
ggc ata gcg cat ctc tcc atg gtg ggg aac tgg gcg aag gtc ctg gta			1460
Gly Ile Ala Tyr Phe Ser Met Val Gly Asn Trp Ala Lys Val Leu Val			
	360	365	370
gtg ctg ctg cta ttt gcc ggc gtc gac gcg gaa acc cag gtc acc ggg			1508
Val Leu Leu Leu Phe Ala Gly Val Asp Ala Glu Thr His Val Thr Gly			
	375	380	385
gga aat gcc ggc cgc ace acg gct ggg ctt gtt ggt ctc ctt acc cca			1556
Gly Asn Ala Gly Arg Thr Thr Ala Gly Leu Val Gly Leu Leu Thr Pro			
	390	395	400
ggc gcc aag cag aac atc caa ctg atc aac acc aac ggc agt tgg cac			1604
Gly Ala Lys Gln Asn Ile Gln Leu Ile Asn Thr Asn Gly Ser Trp His			
	410	415	420
atc aat agc acg gcc ttg aat tgc aat gaa agc ctt aac acc ggc tgg			1652
Ile Asn Ser Thr Ala Leu Asn Cys Asn Glu Ser Leu Asn Thr Gly Trp			
	425	430	435
tta gca ggg ctc ttc tat caa cac aaa ttc aac cct tca ggc tgt cct			1700
Leu Ala Gly Leu Phe Tyr Gln His Lys Phe Asn Ser Ser Gly Cys Pro			
	440	445	450

gag agg tgg gcc agc tgc cga cgc ctt acc gat ccc gcc cag ggc tgg	1748
Glu Arg Leu Ala Ser Cys Arg Arg Leu Thr Asp Phe Ala Gln Gly Trp	
455 460 465	
qgt ccc atc aat tat gcc aac qga aac qgc ctc qac gaa cgc ccc tac	1796
Gly Pro Ile Ser Tyr Ala Asn Gly Ser Gly Leu Asp Glu Arg Pro Tyr	
470 475 480 485	
tgc tgg cac tac cct cca aga cct tgt ggc att gtg ccc gca aag agc	1844
Cys Trp His Tyr Pro Pro Arg Pro Cys Gly Ile Val Pro Ala Lys Ser	
490 495 500	
gtg tgt ggc ccg gta tat tgc ttc act ccc agc ccc gtg gtg gtg gga	1892
Val Cys Gly Pro Val Tyr Cys Phe Thr Pro Ser Pro Val Val Val Gly	
505 510 515	
acg acc gac agg tgg ggc ggc cct acc tac agc tgg ggt gca aat gat	1940
Thr Thr Asp Arg Ser Gly Ala Pro Thr Tyr Ser Trp Gly Ala Asn Asp	
520 525 530	
acg gat gtc ttc gtc ctt aac aac acc agg cca ccg ctg ggc aat tgg	1988
Thr Asp Val Phe Val Leu Asn Asn Thr Arg Pro Pro Leu Gly Asn Trp	
535 540 545	
ttc ggt tgt acc tgg atg aac tca act gga ttc acc aaa gtg tgc gga	2036
Phe Gly Cys Thr Trp Met Asn Ser Thr Gly Phe Thr Lys Val Cys Gly	
550 555 560 565	
gcg ccc ccc tgt gtc atc gga ggg gtg ggc aac aac acc ttg ctc tgc	2084
Ala Pro Pro Cys Val Ile Gly Gly Val Gly Asn Asn Thr Leu Leu Cys	
570 575 580	
ccc act gat tgc ttc cgc aaa cat ccg gaa gcc aca tac tct cgg tgc	2132
Pro Thr Asp Cys Phe Arg Lys His Pro Glu Ala Thr Tyr Ser Arg Cys	
585 590 595	
ggc tcc ggt ccc tgg att aca ccc agg tgc atg gtc gac tac ccg tat	2180
Gly Ser Gly Pro Trp Ile Thr Pro Arg Cys Met Val Asp Tyr Pro Tyr	
600 605 610	
agg ctt tgg cac tat cct tgt acc atc aat tac acc ata ttc aaa gtc	2228
Arg Leu Trp His Tyr Pro Cys Thr Ile Asn Tyr Thr Ile Phe Lys Val	
615 620 625	
agg atg tac gtg gga ggg gtc gag cac agg ctg gaa gcg gcc tgc aac	2276
Arg Met Tyr Val Gly Gly Val Glu His Arg Leu Glu Ala Ala Cys Asn	
630 635 640 645	
tgg acg cgg ggc gaa cgc tgt gat ctg gaa gac agg gac agg tcc gag	2324
Trp Thr Arg Gly Glu Arg Cys Asp Leu Glu Asp Arg Asp Arg Ser Glu	
650 655 660	
cto agc ccg ttg ctg ctg tcc acc aca cag tgg cag gtc ctt ccg tgt	2372
Leu Ser Pro Leu Leu Leu Ser Thr Thr Gln Trp Gln Val Leu Pro Cys	
665 670 675	

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tct ttc acg acc ctg cca gcc ttg tcc acc ggc ctc atc cac ctc cac 2420
Ser Phe Thr Thr Leu Pro Ala Leu Ser Thr Gly Leu Ile His Leu His
680 685 690

cag aac att gtg gac gcg cag tac ttg tac ggg gta ggg toa agc atc 2460
Gln Asn Ile Val Asp Val Gln Tyr Leu Tyr Gly Val Gly Ser Ser Ile
695 700 705

ggg tcc tgg gcc att aag tgg gag tcc gtc gtt ctc ctg ttc ctt ctg 2516
Ala Ser Trp Ala Ile Lys Trp Glu Tyr Val Val Leu Leu Phe Leu Leu
710 715 720 725

ctt gca gac gcg cgc gtc tgc tcc tgc ttg tgg atg atg tta ctc ata 2564
Leu Ala Asp Ala Arg Val Cys Ser Cys Leu Trp Met Met Leu Leu Ile
730 735 740

tcc caa gcc gag gcg gct ttg gag aac ctc gta ata ctc aac gca gca 2612
Ser Gln Ala Glu Ala Ala Leu Glu Asn Leu Val Ile Leu Asn Ala Ala
745 750 755

tcc ctg gcc ggg acg cac ggt ctt gtg tcc ttc ctc gtg ttc ttc tgc 2660
Ser Leu Ala Gly Thr His Gly Leu Val Ser Phe Leu Val Phe Phe Cys
760 765 770

ttt acg tgg tat ctg aag ggt agg tgg gtg ccc gga gcg gtc tac gcc 2708
Phe Ala Trp Tyr Leu Lys Gly Arg Trp Val Pro Gly Ala Val Tyr Ala
775 780 785

ctc tac ggg atg tgg cct ctc ctc ctg ctc ctg gcg tta cct cag 2756
Leu Tyr Gly Met Trp Pro Leu Leu Leu Leu Leu Ala Leu Pro Gln
790 795 800 805

cgg gca tac gca ctg gac arg gag gtg gcc gcg tgg tgt ggc ggc gtt 2804
Arg Ala Tyr Ala Leu Asp Thr Glu Val Ala Ala Ser Cys Gly Gly Val
810 815 820

gtt ctt gtc ggg tta atg gcg ctg acc ctg tgg cca tat tac aag cgc 2852
Val Leu Val Gly Leu Met Ala Leu Thr Leu Ser Pro Tyr Tyr Lys Arg
825 830 835

tat atc agc tgg tgc atg tgg tgg ctt cag tat ttt ctg acc aga gta 2900
Tyr Ile Ser Trp Cys Met Trp Trp Leu Gln Tyr Phe Leu Thr Arg Val
840 845 850

gaa gcg caa ctg caa gtg tgg gtt ccc ccc ctc aac gtc cgg ggg ggg 2948
Glu Ala Gln Leu His Val Trp Val Pro Pro Leu Asn Val Arg Gly Gly
855 860 865

cgc gat gcc gtc atc tta ctc atg tgt gta gta caa cgg acc ctg gta 2996
Arg Asp Ala Val Ile Leu Leu Met Cys Val Val His Pro Thr Leu Val
870 875 880 885

ttt gac atc acc aaa cta ctc ctg gcc atc ttc gga ccc ctt tgg att 3044
Phe Asp Ile Thr Lys Leu Leu Leu Ala Ile Phe Gly Pro Leu Trp Ile
890 895 900

ctt caa gcc agt ttg ctt aaa gtc ccc tac ttc gtg cgc gtt caa ggc 3092

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Leu Gln Ala Ser Leu Leu Lys Val Pro Tyr Phe Val Arg Val Gln Gly
905                      910                      915

ctt ctc cgg acc tgc gcg cta gcg cgg aaq ata gcc gga ggt cat tac 3140
Leu Leu Arg Ile Cys Ala Leu Ala Arg Lys Ile Ala Gly Gly His Tyr
920                      925                      930

gtg caa atg gcc acc atc aag tta ggg gcg ctt act ggc acc tat gtg 3188
Val Gln Met Ala Ile Ile Lys Leu Gly Ala Leu Thr Gly Thr Tyr Val
935                      940                      945

tat aac cat ctc acc cct ctt cga gac tgg gcg cac aac ggc ctg cga 3236
Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala His Asn Gly Leu Arg
950                      955                      960                      965

gat ctg gcc gtg gct gtg gaa cca gtc gtc ttc tcc cga atg gag acc 3284
Asp Leu Ala Val Ala Val Glu Pro Val Val Phe Ser Arg Met Glu Thr
970                      975                      980

aag ctc atc acg tgg ggg gca gat acc gcc gcg tgc ggt gac atc atc 3332
Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile
985                      990                      995

aac ggc ttg ccc gtc tct gcc cgt agg ggc cag gag ata ctg ctt ggg 3380
Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Gln Glu Ile Leu Leu Gly
1000                      1005                      1010

cca gcc gar gga arg gtc tcc aag ggg tgg agg ttg ctg gcg ccc atc 3428
Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu Leu Ala Pro Ile
1015                      1020                      1025

acg gcg tac gcc cag cag acg aga ggc ctc cta ggg tgt ata atc acc 3476
Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr
1030                      1035                      1040                      1045

agc ctg act ggc cgg gac aaa aac caa gtg gag ggt gag gtc cag atc 3524
Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Ile
1050                      1055                      1060

gtg tca act gct acc caa acc ttc ctg gca acg tgc atc aar ggg gta 3572
Val Ser Thr Ala Thr Gln Thr Phe Leu Ala Thr Cys Ile Asn Gly Val
1065                      1070                      1075

tgc tgg act gtc tac cac ggg gcc gga aag agg acc atc gca tca ccc 3620
Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr Ile Ala Ser Pro
1080                      1085                      1090

aag ggt cct gtc atc caa atg tat acc aat gtg gac caa gac ctt gtg 3668
Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val
1095                      1100                      1105

ggc tgg ccc gct cct caa ggt tcc cgc tca ttg aca ccc tqt acc tgc 3716
Gly Trp Pro Ala Pro Gln Gly Ser Arg Ser Leu Thr Pro Cys Thr Cys
1110                      1115                      1120                      1125

ggc tcc tcc gac ctt tac ctg gtc acg agg cac gcc gat gtc att ccc 3764
Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro

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	1130	1135	1140	
gtg cgc cgg cga ggt gat agc agg ggt agc ctg ctt tgc ccc cgg ccc				3812
Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro	1145	1150	1155	
atc tcc tac ttg aaa ggc tcc tgc ggg ggt ccg ctg ttg tgc ccc gcg				3860
Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ala	1160	1165	1170	
gga ccc gcc gtg ggc cta ttc agg gnc gcg gtg tgc acc cgt gga gtg				3908
Gly His Ala Val Gly Leu Phe Arg Ala Ala Val Cys Thr Arg Gly Val	1175	1180	1185	
gct aaa gcg gtg gac ttt atc oct gtg gag aac cta ggg aca acc atg				3956
Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn Leu Gly Thr Thr Met	1190	1195	1200	1205
aga tcc ccg gtg ttc acg gac aac tcc tct cca cca gca gtg ccc cag				4004
Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln	1210	1215	1220	
agc ttc cag gtg gcc cac ctg cat gct ccc acc ggc agc ggt aag agc				4052
Ser Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser	1225	1230	1235	
acc aag atc ccg gct gcg tac gca gcc cag ggc tac aag gtg ttg gtg				4100
Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val	1240	1245	1250	
ctc aac ccc tct gtt gct gca acg ctg ggc tat ggt gct tac atg tcc				4148
Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser	1255	1260	1265	
aag gcc cat ggg gtt gat cct aat atc agg acc ggg gtg aga aca att				4196
Lys Ala His Gly Val Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile	1270	1275	1280	1285
acc act ggc agc ccc atc acg tac tcc acc tac ggc aag ttc ctt gcc				4244
Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala	1290	1295	1300	
gac ggc ggg tgc tca gga ggt gct tat gac ata ata att tgt gac gac				4292
Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu	1305	1310	1315	
tgc cac tcc acg gat gcc aca tcc atc ttg ggc acc ggc act gtc ctt				4340
Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu	1320	1325	1330	
gac caa gca gag act gcg ggg gcg aga ctg gtt gtg ctc gcc act gct				4388
Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala	1335	1340	1345	
acc cct ccg ggc tcc gtc act gtg tcc cat cct aac atc gag gag gtt				4436
Thr Pro Pro Gly Ser Val Thr Val Ser His Pro Asn Ile Glu Glu Val	1350	1355	1360	1365

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gct ctg tcc acc acc gga gag atc ccc ttt tac ggc aag got ato ccc 4484
Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro
1370 1375 1380

ctc gag gtg atc aag ggg gga aga cat ctc atc ttc tgc cac tca aag 4532
Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys
1385 1390 1395

aag aag tgc gac gag ctc gcc gcg aag ctg gtc gca ttg ggc atc nat 4580
Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn
1400 1405 1410

ccc atc ccc tac tac cgc ggt ctt gac gtg tct gtc atc ccc acc agc 4628
Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser
1415 1420 1425

ggc gat gtt gtc gtc gtg tgc acc gat gct ctc atg act ggc ccc acc 4676
Gly Asp Val Val Val Val Ser Thr Asp Ala Leu Met Thr Gly Phe Thr
1430 1435 1440 1445

ggc gac ttc gac tct gtg ata gac tgc aac ccg tgt gtc act cag aca 4724
Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr
1450 1455 1460

gtc gat ttc agc ctt gac cct acc ttt acc att gag aca acc acg ctc 4772
Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Leu
1465 1470 1475

ccc cag gat gct gtc tcc agg act caa ccc ccg ggc agg act gcc aag 4820
Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly Arg
1480 1485 1490

ggg aag cca ggc atc tat aga ttt gtg gca ccg ggg gag cgc ccc tcc 4868
Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg Pro Ser
1495 1500 1505

ggc atg ttc gac tgc tcc gtc ctc tgt gag tgc tat gac gcg ggc tgt 4916
Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys
1510 1515 1520 1525

gct tgg tat gag ctc acg ccc gcc gag act aca gtt agg cta cga gcc 4964
Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu Arg Ala
1530 1535 1540

cac atg aac acc ccg ggg ctt ccc gtg tgc cag gac cat ctt gaa ttt 5012
Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe
1545 1550 1555

tgg gag ggc gtc ttt acg ggc ctc act cat ata gat gcc cac ttt tta 5060
Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu
1560 1565 1570

tcc cag aca aag cag agt ggg gag aac ttt cct tac ctg gta gcg tac 5108
Ser Gln Thr Lys Gln Ser Gly Glu Asn Phe Pro Tyr Leu Val Ala Tyr
1575 1580 1585

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caa gcc acc gtg tgc gct agg gct caa gcc cct ccc cca tgg tgg gac 5156
Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp
1590 1595 1600 1605

cag atg tgg aag tgt ttg atc cgc ctt aaa ccc acc ctc cat ggg cca 5204
Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro
1610 1615 1620

aca ccc ctg cta tac aga ctg ggc gct gtt cag aat gaa gtc acc ctg 5252
Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Leu
1625 1630 1635

acg cac cca atc acc aaa tac atc atg aca tgc atg tgg gcc gac ctg 5300
Thr His Pro Ile Thr Lys Tyr Ile Met Thr Cys Met Ser Ala Asp Leu
1640 1645 1650

gag gtc gtc acg agc acc tgg gtg ctc gtt ggc ggc gtc ctg gct gct 5348
Glu Val Val Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala
1655 1660 1665

ctg gcc gcg tat tgc ctg tca aca ggc tgc gtg gtc ata gtg ggc agg 5396
Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val Val Ile Val Gly Arg
1670 1675 1680 1685

atc gtc tgg tcc ggg aag ccg gca att ata ccc gac agg gag gtt ctc 5444
Ile Val Leu Ser Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu
1690 1695 1700

tac cag gag ttc gat gag atg gaa gag tgc tct cag cac tta ccg tac 5492
Tyr Gln Glu Phe Asp Glu Met Glu Glu Cys Ser Gln His Leu Pro Tyr
1705 1710 1715

atc gag caa ggg atg atg ctc gct gag cag ttc aag caa aag gcc ctc 5540
Ile Glu Gln Gly Met Met Leu Ala Glu Gln Phe Lys Gln Lys Ala Leu
1720 1725 1730

ggc ctc ctg cag acc gcg tcc cgc cat gca gag gtt atc acc cct gct 5588
Gly Leu Leu Gln Thr Ala Ser Arg His Ala Glu Val Ile Thr Pro Ala
1735 1740 1745

gtc cag acc aac tgg cag aaa ctc gag gtc ttt tgg gcg aag cac atg 5636
Val Gln Thr Asn Trp Gln Lys Leu Glu Val Phe Trp Ala Lys His Met
1750 1755 1760 1765

tgg aat ttc ato agt ggg ata caa tac ttg gcg ggc ctg tca acg ctg 5684
Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu
1770 1775 1780

cct ggt aac ccc gcc att gct tca ttg atg gct ttt aca gct gcc gtc 5732
Pro Gly Asn Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ala Val
1785 1790 1795

acc ago cca cta acc act ggc caa acc ctc ctc ttc aac ata ttg ggg 5780
Thr Ser Pro Leu Thr Thr Gly Gln Thr Leu Leu Phe Asn Ile Leu Gly
1800 1805 1810

ggg tgg gtg gct gcc cag ctc gcc gcc ccc ggt gcc gct act gcc ttt 5828

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Gly Trp Val Ala Ala Gln Leu Ala Ala Pro Gly Ala Ala Thr Ala Phe	
1815 1820 1825	
gtg ggt gct ggc cta gct ggc gcc gcc atc ggc agc gtt gga ctg ggg	5976
Val Gly Ala Gly Leu Ala Gly Ala Ala Ile Gly Ser Val Gly Leu Gly	
1830 1835 1840 1845	
aaa gtc ctc gtg gac att ctt gca ggg tat ggc gcg ggc gtg gcg gga	5974
Lys Val Leu Val Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly	
1850 1855 1860	
gct ctt gta gca ttc aag atc atg agc ggt gag gtc ccc tcc aag gag	5972
Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser Thr Glu	
1865 1870 1875	
gac ctg gtc aat ctg ctg ccc gcc atc ctc tgc cct gga gcc ctt gta	6020
Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val	
1880 1885 1890	
gtc ggt gtg gtc tgc gca gca ata ctg cgc cgg cac gtt ggc ccg ggc	6068
Val Gly Val Val Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly	
1895 1900 1905	
gag ggg gca gtg caa tgg atg aac cgg cta ata gcc ttc gcc tcc cgg	6116
Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg	
1910 1915 1920 1925	
ggg aac cat gtt tcc ccc aag cac tac gtg ccg gag aac cat gca gcc	6164
Gly Asn His Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala	
1930 1935 1940	
gcc cgc gtc act gcc ata ctc agc agc ctc act gta acc cag ctc ctg	6212
Ala Arg Val Thr Ala Ile Leu Ser Ser Leu Thr Val Thr Gln Leu Leu	
1945 1950 1955	
agg cga ctg cat cag tgg ata agc tgc gag tgt ccc act cca tgc tgc	6260
Arg Arg Leu His Gln Trp Ile Ser Ser Glu Cys Thr Thr Pro Cys Ser	
1960 1965 1970	
ggt tcc tgg cta agg gac atc tgg gac tgg ata tgc gag gtg ctg agc	6308
Gly Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val Leu Ser	
1975 1980 1985	
gac ttt aag acc tgg ctg aaa gcc aag ctc atg cca caa ctg cct ggg	6356
Asp Phe Lys Thr Trp Leu Lys Ala Lys Leu Met Pro Gln Leu Pro Gly	
1990 1995 2000 2005	
att ccc ttt gtg tcc tgc cag cgc ggg tat agg ggg gtc tgg cga gga	6404
Ile Pro Phe Val Ser Cys Gln Arg Gly Tyr Arg Gly Val Trp Arg Gly	
2010 2015 2020	
gac ggc att atg cac act cgc tgc cac tgt gga gct gag atc act gga	6452
Asp Gly Ile Met His Thr Arg Cys His Cys Gly Ala Glu Ile Thr Gly	
2025 2030 2035	
cat gtc aaa aac ggg acg atg agg atc gtc cat cct agg acc tgc agg	6500
His Val Lys Asn Gly Thr Met Arg Ile Val Gly Pro Arg Thr Cys Arg	

2040	2045	2050	
aac atg tgg agt ggg aag ttc ccc att aac gcc tac acc acc ggc ccc			6548
Asn Met Trp Ser Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro			
2055	2060	2065	
tgt acc ccc ctt cct ggc cgg aac tat aag ttc ggc ctg tgg agg gtg			6596
Cys Thr Pro Leu Pro Ala Pro Asn Tyr Lys Phe Ala Leu Trp Arg Val			
2070	2075	2080	2085
tat gca gag gaa tac gtg gag ata agg cgg gtg ggg gac ttc cac tac			6644
Ser Ala Glu Glu Tyr Val Glu Ile Arg Arg Val Gly Asp Phe His Tyr			
	2090	2095	2100
gta tgg ggt atg act act gac aat ctt aaa tgc cgg tgc cag atc cca			6692
Val Ser Gly Met Thr Thr Asp Asn Leu Lys Cys Pro Cys Glu Ile Pro			
	2105	2110	2115
tgg ccc gaa ttt ttc aca gaa tgg gac ggg gtg cgc cta cac agg ttt			6740
Ser Pro Glu Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His Arg Phe			
	2120	2125	2130
ggg ccc cct tgg aag ccc ttg ctg cgg gag gag gta tca ttc aga gta			6788
Ala Pro Pro Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe Arg Val			
	2135	2140	2145
gga ctc cnc gag tac ccg gtg ggg tgg caa tta cct tgc gag ccc gaa			6816
Gly Leu His Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu			
	2155	2160	2165
ccg gac gta gcc gtg ttg acg tcc atg ctc act gat ccc tcc cat ata			6884
Pro Asp Val Ala Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile			
	2170	2175	2180
aca sca gag gcg gcc ggg aga agg tgg gcg aga ggg tca ccc cct tot			6932
Thr Ala Glu Ala Ala Gly Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser			
	2185	2190	2195
atg gcc agc tcc tgg gct agc cag ctg tcc gct cca tot ctc aag sca			6980
Met Ala Ser Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala			
	2200	2205	2210
act tgc acc gcc aac cat gac tcc cct gac gcc gag ctc ata gag gct			7028
Thr Cys Thr Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile Glu Ala			
	2215	2220	2225
aac ctc ctg tgg agg cag caa atg ggc aac atc acc agg gtt gag			7076
Asn Leu Leu Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu			
	2235	2240	2245
tca gag aac aaa gtg gtg att ctg gac tcc ttc gat ccg ctc gtg gca			7124
Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu Val Ala			
	2250	2255	2260
gag gag gat gag cgg gag gtc ncc gta cct gca gaa att ctg cgg aag			7172
Glu Glu Asp Glu Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Lys			
	2265	2270	2275

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aac ccc ccg cta gta gag acg tgg aaa aag cct gac tac gaa cca cct Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu Pro Pro 2295 2300 2305	7268
gtg gtc cat ggc tgc ccg cta cca cct cca cgg tcc cct cct gtc cct Val Val His Gly Cys Pro Leu Pro Pro Pro Arg Ser Pro Pro Val Pro 2310 2315 2320 2325	7316
ccg cct cgg aaa aag cgt acg gtg gtc ccc acc gaa tca acc cta tct Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr Leu Ser 2330 2335 2340	7364
act gcc ttg gcc gag ctt gcc acc aaa agt ttt ggc agc tcc tca act Thr Ala Leu Ala Glu Leu Ala Thr Lys Ser Phe Gly Ser Ser Ser Thr 2345 2350 2355	7412
tcc ggc att acg ggc gac aat acg aca aca tcc tct gag ccc gcc cct Ser Gly Ile Thr Gly Asp Asn Thr Thr Ser Ser Glu Pro Ala Pro 2360 2365 2370	7460
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ccc ctg gag ggg gag cct ggg gat ccg gat cto agc gac ggg tca tgg Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp 2390 2395 2400 2405	7556
tcg acg gtc agt agt ggg gcc gac acg gaa gat gtc gtc tgc tgc tca Ser Thr Val Ser Ser Gly Ala Asp Thr Glu Asp Val Val Cys Cys Ser 2410 2415 2420	7604
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gaa caa aaa ctg ccc atc aac gca ctg agc aac tgg ttg cta cgc cat Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His 2440 2445 2450	7700
cac aat ctg gtg cat tcc acc act toa cgc agt gct tgc caa agg cag His Asn Leu Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln Arg Gln 2455 2460 2465	7748
aag aaa ctc aca ttt gac aga ctg caa gtt ctg gac agc cat tac cag Lys Lys Val Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His Tyr Gln 2470 2475 2480 2485	7796
gac gtg ctc aag gag gtc aaa gca gcg gcg tca aaa gtg aag gct aac Asp Val Leu Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys Ala Asn 2490 2495 2500	7844

ttg cta tcc gta gag gaa gct tgc agc ctg aag ccc cca cat tca gcc Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His Ser Ala 2505 2510 2515	7892
aaa tcc aag tct ggc tat ggg gca aaa gac gtc cgt tgc cat gcc aga Lys Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His Ala Arg 2520 2525 2530	7940
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gag agg ctt tat gtt ggg ggc cct ctt acc aat tca agg ggg gaa aac Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn 2680 2685 2690	8420
tgc gcc tac cgc agg tgc cgc gcc agc ggc gta ctg aca act aac tgt Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys 2695 2700 2705	8468
ggc aac acc ctc act tgc tac atc aag gcc cgg gca gcc tgt cga gcc Gly Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala 2710 2715 2720 2725	8516
gca ggg ctc cag gac tgc acc atg ctc gtg tgt ggc gac gac tca gtc	8564

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Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
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Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg
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gcc ttc acg gag got atg acc agg tac tcc gcc ccc ccc ggg gat ccc      8660
Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro
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cca caa cca gaa tac gac ttg gag ctt ata aca tca tgc tcc tcc aac      8708
Pro Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn
      2775                      2780                      2785

gtg tca gtc gcc cac gac ggc gct gga aag agg gtc tac cac ctt acc      8756
Val Ser Val Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr
      2790                      2795                      2800                      2805

cgt gac cct aca acc ccc ctg gcg aga gcc gcg tgg gag aca gca aga      8804
Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg
      2810                      2815                      2820

cac act cca gcc aat tcc tgg cta ggc aac ata atc atg ttt gcc ccc      8852
His Thr Pro Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro
      2825                      2830                      2835

aca ctg tgg gcg agg atg ata ctg atg acc cat ttc ttt agc gtc ctg      8900
Thr Leu Trp Ala Arg Met Ile Leu Met Thr His Phe Phe Ser Val Leu
      2840                      2845                      2850

ata gcc agg gat cag ctt gaa cag gct ctt aac tgt gag atc rac gga      8948
Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asn Cys Glu Ile Tyr Gly
      2855                      2860                      2865

gcc tgc tac tcc ata gaa cca ctg gat cta cct cca atc att caa aga      8996
Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile Gln Arg
      2870                      2875                      2880                      2885

ctc cat ggc ctg agt gca ttr tca ctg cac agt tac tct cca ggt gaa      9044
Leu His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu
      2890                      2895                      2900

atc aat agg gtg gcc gca tgc ctg aga aaa ctt ggg gtc cgg ccc ttg      9092
Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro Pro Leu
      2905                      2910                      2915

cga gct tgg aga cac cgg gcc cgg agc gtc cgc gct agg ctt ctg tcc      9140
Arg Ala Trp Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser
      2920                      2925                      2930

aga gga ggc agg gct gcc ata tat ggc aag tac ctg ttc aac cgg gca      9188
Arg Gly Gly Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn Trp Ala
      2935                      2940                      2945

gta aga aca aag ctg aaa ctg act cca ata gcg gcc got ggc cgg ctg      9236
Val Arg Thr Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly Arg Leu

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2950          2955          2960          2965
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Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp Ile Tyr
      2970      2975      2980

cac agc gtg tct cat gcc cgg ccc cgc tgg ttc tgg ttt tgc cta ctg 9332
His Ser Val Ser His Ala Arg Pro Arg Trp Phe Trp Phe Cys Leu Leu
      2985      2990      2995

ctg ctg gct gca ggg gta ggc atc tac ctg ctg ccc aac cga tga 9377
Leu Leu Ala Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg
      3000      3005      3010

aggctggggc aaacactccg gccctttaag ccatttctctg tttttttttt tttttttttt 9437
ttttttttct tttttttttt ctttcttttc cttttttttt tctttttttt tttttttttt 9497
taatgggtggc tccatcttag ccttagtoac ggctagctgt gaaaggctccg tgaagccgat 9557
gactgcagag agtgcctgata ctggcotctc tgcagatcat gc 9599

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<211> 3011
<212> DRT
<213> Hepatitis C virus

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  1          5          10          15
Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly
  20          25          30
Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
  35          40          45
Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
  50          55          60
Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly
  65          70          75          80
Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
  85          90          95
Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro
  100         105         110
Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys
  115         120         125
Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu
  130         135         140
Gly Gly Ala Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
  145         150         155         160
Gly Val Asn Tyr Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
  165         170         175
Phe Leu Leu Ala Leu Leu Ser Cys Leu Thr Val Pro Ala Ser Ala Tyr
  180         185         190
Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys Pro
  195         200         205
Asn Ser Ser Ile Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr Pro
  210         215         220

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Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp Val
 225 230 235 240
 Ala Val Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr
 245 250 255
 Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys
 260 265 270
 Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly
 275 280 285
 Gln Leu Phe Thr Phe Ser Pro Arg Arg His Trp Thr Thr Gln Asp Cys
 290 295 300
 Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg Met Ala Trp
 305 310 315 320
 Asp Met Met Met Asn Trp Ser Pro Thr Ala Ala Leu Val Val Ala Gln
 325 330 335
 Leu Leu Arg Ile Pro Gln Ala Ile Met Asp Met Ile Ala Gly Ala His
 340 345 350
 Trp Gly Val Leu Ala Gly Ile Ala Tyr Phe Ser Met Val Gly Asn Trp
 355 360 365
 Ala Lys Val Leu Val Val Leu Leu Phe Ala Gly Val Asp Ala Glu
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 Thr His Val Thr Gly Gly Asn Ala Gly Arg Thr Thr Ala Gly Leu Val
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 Gly Leu Leu Thr Pro Gly Ala Lys Gln Asn Ile Gln Leu Ile Asn Thr
 405 410 415
 Asn Gly Ser Trp His Ile Asn Ser Thr Ala Leu Asn Cys Asn Glu Ser
 420 425 430
 Leu Asn Thr Gly Trp Leu Ala Gly Leu Phe Tyr Gln His Lys Phe Asn
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 Ser Ser Gly Cys Pro Glu Arg Leu Ala Ser Cys Arg Arg Leu Thr Asp
 450 455 460
 Phe Ala Gln Gly Trp Gly Pro Ile Ser Tyr Ala Asn Gly Ser Gly Leu
 465 470 475 480
 Asp Glu Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Pro Cys Gly Ile
 485 490 495
 Val Pro Ala Lys Ser Val Cys Gly Pro Val Tyr Cys Phe Thr Pro Ser
 500 505 510
 Pro Val Val Val Gly Thr Thr Asp Arg Ser Gly Ala Pro Thr Tyr Ser
 515 520 525
 Trp Gly Ala Asn Asp Thr Asp Val Phe Val Leu Asn Asn Thr Arg Pro
 530 535 540
 Pro Leu Gly Asn Trp Phe Gly Cys Thr Trp Met Asn Ser Thr Gly Phe
 545 550 555 560
 Thr Lys Val Cys Gly Ala Pro Pro Cys Val Ile Gly Gly Val Gly Asn
 565 570 575
 Asn Thr Leu Leu Cys Pro Thr Asp Cys Phe Arg Lys His Pro Glu Ala
 580 585 590
 Thr Tyr Ser Arg Cys Gly Ser Gly Pro Trp Ile Thr Pro Arg Cys Met
 595 600 605
 Val Asp Tyr Pro Tyr Arg Leu Trp His Tyr Pro Cys Thr Ile Asn Tyr
 610 615 620
 Thr Ile Phe Lys Val Arg Met Tyr Val Gly Gly Val Glu His Arg Leu
 625 630 635 640
 Glu Ala Ala Cys Asn Trp Thr Arg Gly Glu Arg Cys Asp Leu Glu Asp
 645 650 655
 Arg Asp Arg Ser Glu Leu Ser Pro Leu Leu Leu Ser Thr Thr Gln Trp
 660 665 670
 Gln Val Leu Pro Cys Ser Phe Thr Thr Leu Pro Ala Leu Ser Thr Gly

675 680 685
Leu Ile His Leu His Gln Asn Ile Val Asp Val Gln Tyr Leu Tyr Gly
690 695 700
Val Gly Ser Ser Ile Ala Ser Trp Ala Ile Lys Trp Glu Tyr Val Val
705 710 715 720
Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys Ser Cys Leu Trp
725 730 735
Met Met Leu Leu Ile Ser Gln Ala Glu Ala Ala Leu Glu Asn Leu Val
740 745 750
Ile Leu Asn Ala Ala Ser Leu Ala Gly Thr His Gly Leu Val Ser Phe
755 760 765
Leu Val Phe Phe Cys Phe Ala Trp Tyr Leu Lys Gly Arg Trp Val Pro
770 775 780
Gly Ala Val Tyr Ala Leu Tyr Gly Met Trp Pro Leu Leu Leu Leu Leu
785 790 795 800
Leu Ala Leu Pro Gln Arg Ala Tyr Ala Leu Asp Thr Glu Val Ala Ala
805 810 815
Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala Leu Thr Leu Ser
820 825 830
Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Met Trp Trp Leu Gln Tyr
835 840 845
Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp Val Pro Pro Leu
850 855 860
Asn Val Arg Gly Gly Arg Asp Ala Val Ile Leu Leu Met Cys Val Val
865 870 875 880
His Pro Thr Leu Val Phe Asp Ile Thr Lys Leu Leu Ala Ile Phe
885 890 895
Gly Pro Leu Trp Ile Leu Gln Ala Ser Leu Leu Lys Val Pro Tyr Phe
900 905 910
Val Arg Val Gln Gly Leu Leu Arg Ile Cys Ala Leu Ala Arg Lys Ile
915 920 925
Ala Gly Gly His Tyr Val Gln Met Ala Ile Ile Lys Leu Gly Ala Leu
930 935 940
Thr Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala
945 950 955 960
His Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe
965 970 975
Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala
980 985 990
Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Gln
995 1000 1005
Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg
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Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val
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Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu
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Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn
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1265 1270 1275 1280
Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr
1285 1290 1295
Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile
1300 1305 1310
Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly
1315 1320 1325
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Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr
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Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile
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Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile
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Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg
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Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro
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Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys
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1555 1560 1565
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1585 1590 1595 1600
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Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly Ala Ala Ile Gly
1825 1830 1835 1840
Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu Ala Gly Tyr Gly
1845 1850 1855
Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu
1860 1865 1870
Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser
1875 1880 1885
Pro Gly Ala Leu Val Val Gly Val Val Cys Ala Ala Ile Leu Arg Arg
1890 1895 1900
His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile
1905 1910 1915 1920
Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val Pro
1925 1930 1935
Glu Ser Asp Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu Thr
1940 1945 1950
Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile Ser Ser Glu Cys
1955 1960 1965
Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile
1970 1975 1980
Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys Ala Lys Leu Met
1985 1990 1995 2000
Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln Arg Gly Tyr Arg
2005 2010 2015
Gly Val Trp Arg Gly Asp Gly Ile Met His Thr Arg Cys His Gly
2020 2025 2030
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2130 2135 2140
Val Ser Phe Arg Val Gly Leu His Glu Tyr Pro Val Gly Ser Gln Leu
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Gly Ser Pro Pro Ser Met Ala Ser Ser Ala Ser Gln Leu Ser Ala
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Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp Ser Pro Asp Ala
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Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe
2245 2250 2255
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Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Arg Ala Leu Pro Val Trp
2275 2280 2285
Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro
2290 2295 2300
Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Arg
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Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr
2325 2330 2335
Glu Ser Thr Leu Ser Thr Ala Leu Ala Glu Leu Ala Thr Lys Ser Phe
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Gly Ser Ser Ser Thr Ser Gly Ile Thr Gly Asp Asn Thr Thr Ser
2355 2360 2365
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2370 2375 2380
Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu
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2405 2410 2415
Val Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr
2420 2425 2430
Pro Cys Ala Ala Glu Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn
2435 2440 2445
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Lys Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Thr

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ARG CYS HIS ALA ARG LYS ALA VAL ALA HIS ILE ASN SER VAL TRP LYS
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ASP LEU LEU GLU ASP SER VAL THR PRO ILE ASP THR THR ILE MET ALA
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LYS ASN GLU VAL PHE CYS VAL GLN PRO GLU LYS GLY GLY ARG LYS PRO
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ALA ARG LEU ILE VAL PHE PRO ASP LEU GLY VAL ARG VAL CYS GLU LYS
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MET ALA LEU TYR ASP VAL VAL SER LYS LEU PRO LEU ALA VAL MET GLY
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SER SER TYR GLY PHE GLN TYR SER PRO GLY GLN ARG VAL GLU PHE LEU
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VAL GLN ALA TRP LYS SER LYS LYS THR PRO MET GLY PHE SER TYR ASP
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THR ARG CYS PHE ASP SER THR VAL THR GLU SER ASP ILE ARG THR GLU
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GLU ALA ILE TYR GLN CYS CYS ASP LEU ASP PRO GLN ALA ARG VAL ALA
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ILE LYS SER LEU THR GLU ARG LEU TYR VAL GLY GLY PRO LEU THR ASN
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SER ARG GLY GLU ASN CYS GLY TYR ARG ARG CYS ARG ALA SER GLY VAL
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LEU THR THR SER CYS GLY ASN THR LEU THR CYS TYR ILE LYS ALA ARG
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GLY ASP ASP LEU VAL VAL ILE CYS GLU SER ALA GLY VAL GLN GLU ASP
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2755      2760      2765
PRO PRO GLY ASP PRO PRO GLN PRO GLU TYR ASP LEU GLU LEU ILE THR
2770      2775      2780
SER CYS SER SER ASN VAL SER VAL ALA HIS ASP GLY ALA GLY LYS ARG
2785      2790      2795      2800
VAL TYR TYR LEU THR ARG ASP PRO THR THR PRO LEU ALA ARG ALA ALA
2805      2810      2815
TRP GLU THR ALA ARG HIS THR PRO VAL ASN SER TRP LEU GLY ASN ILE
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ILE MET PHE ALA PRO THR LEU TRP ALA ARG MET ILE LEU MET THR HIS
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PHE PHE SER VAL LEU ILE ALA ARG ASP GLN LEU GLU GLN ALA LEU ASN
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CYS GLU ILE TYR GLY ALA CYS TYR SER ILE GLU PRO LEU ASP LEU PRO
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PRO ILE ILE GLN ARG LEU HIS GLY LEU SER ALA PHE SER LEU HIS SER
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TYR SER PRO GLY GLU ILE ASN ARG VAL ALA ALA CYS LEU ARG LYS LEU
2900      2905      2910
GLY VAL PRO PRO LEU ARG ALA TRP ARG HIS ARG ALA ARG SER VAL ARG
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ALA ARG LEU LEU SER ARG GLY GLY ARG ALA ALA ILE CYS GLY LYS TYR
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LEU PHE ASN TRP ALA VAL ARG THR LYS LEU LYS LEU THR PRO ILE ALA
2945      2950      2955      2960

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